

## CLAIMS:

1. A pharmaceutical composition comprising
  - a) a therapeutically effective amount of exo-R-mecamylamine or a pharmaceutically acceptable salt thereof, substantially free of exo-S-mecamylamine;
  - 5 b) a pharmaceutically acceptable carrier; and
  - c) pharmaceutically acceptable excipients.
2. The composition of claim 1 wherein the amount is about 0.5 mg to about 1000 mg.
3. The composition of claim 1 which is adapted for administration intravenously, 10 transdermally, intrathecally, orally intramuscularly, intrathecally or by bolus injection.
4. The composition of claim 1 which is adapted for use in a transdermal formulation or patch, solid or liquid preparation, sustained release formulation, tablet, capsule or gel cap.
5. The pharmaceutical composition of claim 1 wherein the substantially pure exo-R-mecamylamine is greater than 95% by weight and exo-S-mecamylamine is less than 5% by 15 weight.
6. The pharmaceutical composition of claim 1 wherein the substantially pure exo-R-mecamylamine is greater than greater than 98% by weight and exo-S-mecamylamine is less than 2% by weight.
7. The pharmaceutical composition of claim 1 wherein the substantially pure exo-R-mecamylamine is greater than greater than 99% by weight and exo-S-mecamylamine is less than 20 1% by weight.
8. The pharmaceutical composition of claim 1 wherein the substantially pure exo-R-mecamylamine is greater than 99.5% by weight and exo-S-mecamylamine is less than 0.5% by weight.
- 25 9. The pharmaceutical composition of claim 1 wherein the substantially pure exo-R-mecamylamine is greater than 99.7% by weight and exo-S-mecamylamine is less than 0.3% by weight.
10. A method of treating a substance addiction in a mammal, said method comprising administering a therapeutically effective amount of exo-R-mecamylamine or a pharmaceutically

acceptable salt thereof, substantially free of its exo-S-mecamylamine, said amount being sufficient to be alleviate cravings.

11. The method of claim 10 wherein the substance addiction involves nicotine, cocaine, alcohol, amphetamine, opiate, other psychostimulant and a combination thereof.

5 12. A method of treating Tourette's Syndrome in a human in need thereof, the method comprising administering to the human with Tourette's syndrome, a therapeutically effective amount of exo-R-mecamylamine or a pharmaceutically acceptable salt thereof, substantially free of exo-S-mecamylamine, the amount being sufficient to decrease the signs and symptoms of Tourette's Syndrome.

10 13. The method of claim 12 wherein exo-R-mecamylamine is administered intravenously, transdermally, intrathecally, orally or by bolus injection.

14. The method of claim 12, wherein the amount is about 0.5 mg to about 20 mg.

15 15. The method of claim 12, wherein exo-R-mecamylamine is administered one to four times per day.

16. A method of treating a human with a neuropsychiatric disorders, the method comprising administering to the human in need thereof, a therapeutically effective amount of exo-R-mecamylamine or a pharmaceutically acceptable salt thereof, substantially free of exo-S-mecamylamine, the amount being sufficient to decrease the signs and symptoms of the neuropsychiatric disorder.

20 17. The method of claim 16 wherein the neuropsychiatric disorder is bipolar disorder, depression, an anxiety disorder, schizophrenia, a seizure disorder, Parkinson's disease and attention deficit hyperactivity disorder.

18. The method of claim 16 wherein exo-R-mecamylamine is administered intravenously, transdermally, intrathecally, orally or by bolus injection.

25 19. The method of claim 16, wherein the amount is about 0.5 mg to about 20 mg.

20. The method of claim 16, wherein exo-R-mecamylamine is administered one to four times per day.